

ECOTERRA

**JOURNAL OF ENVIRONMENTAL
RESEARCH AND
PROTECTION**

Printed ISSN: 1584-7071
Online ISSN: 2248-3128

2015, Volume 12, Issue 4

2015, Volume 12, Issue 4

The owners of this journal are National Society of Environmental Science and Engineering; S.C. ICPE Bistrița S.A., and University Babeș-Bolyai from Cluj-Napoca, Faculty of Environmental Sciences and Engineering. In research organisations evaluation, assign this journal to: National Society of Environmental Science and Engineering; S.C. ICPE Bistrița S.A., and University Babeș-Bolyai from Cluj-Napoca, Faculty of Environmental Sciences and Engineering. In publisher's evaluation, assign this journal to Bioflux Publishing House, Cluj-Napoca.

ECOTERRA Journal of Environmental Research and Protection is indexed, abstracted or full text reproduced by/in the following scholar/scientific databases, engines, publishers:

Index Copernicus International - I.C. Journal Master List
Serials Solutions
Ulrichs Periodicals Directory
CABI Global Health
CABI CAB Abstracts
Directory of Abstract Indexing for Journals (DAIJ)
Google Scholar, Academic (search engine)
Google (search engine)
Eurasian Scientific Journal Index
InfoBase Index

Printed ISSN: 1584-7071
Online ISSN: 2248-3128

EDITORIAL BOARD

Editors-in-Chief

Ozunu Alexandru, "Babes-Bolyai" University, Romania

Vlad Grigore, S.C. ICPE Bistrița S.A., Romania

Managing-Editor

Gavriloaie Ionel-Claudiu, S.C. ICPE Bistrița S.A., Romania

Editorial Advisory Board

Arafat Raed, Ministry of Internal Affairs, Romania

Baciu Călin, "Babes-Bolyai" University, Romania

Bălțeanu Dan, Institute of Geography of the Romanian Academy, Romania

Berkesy Corina, S.C. ICPE Bistrița S.A., Romania

Blas Sevillano Raúl Humberto, Univ. Nacional Agraria La Molina, Peru

Böhm József, University from Miskolc, Hungary

Bolovan Ioan, "Babes-Bolyai" University, Romania

Botezan Camelia, "Babes-Bolyai" University, Romania

Burny Philippe, Centre Wallon de Recherches Agronomiques, Belgium

Chiribucă Dan, "Babes-Bolyai" University, Romania

Cornea Nicolae, General Inspectorate for Emergency Situations, Romania

Cosma Constantin, "Babes-Bolyai" University, Romania

Critto Andreea, Università Ca' Foscari di Venezia, Italy

Dan Viorel, Technical University of Cluj-Napoca, Romania

Elekes Tibor, University from Miskolc, Hungary

Etiopie Giuseppe, Istituto Nazionale di Geofisica e Vulcanologia, Italy

Gavrilescu Maria, "Gheorghe Asachi" Technical University of Iasi, Romania

Gurlui Silviu, "Alexandru Ioan Cuza" University, Romania

Gurză Eugen, Environmental Health Centre, Romania

Heredea Nicolae, NHN Ecoinvest Ltd, Romania

Hosu Ioan, "Babes-Bolyai" University, Romania

Jelemenský Ľudovít, Slovak University of Technology, Slovakia

Kalmár Ioan, Geological Institute of Hungary, Budapest, Hungary

Krausmann Elisabeth, Joint Research Centre, Italy

Lazăr Gabriel, University of Bacău, Romania

Literat Liviu, "Babes-Bolyai" University, Romania

Macoveanu Matei, "Gheorghe Asachi" Technical University of Iasi, Romania

Maria Gheorghe, Politehnica University of Bucharest, Romania

Markoš Jozef, Slovak University of Technology, Slovakia

Markowski Adam, Technical University of Lodz, Poland

Micle Valer, Technical University of Cluj-Napoca, Romania

Misra Bijay Anand, School of Planning and Architecture, India

Muntean Liviu, "Babes-Bolyai" University, Romania

Nașcu Ioan, Technical University from Cluj-Napoca, Romania

Nicolae Doina, National Institute of R&D for Optoelectronics, Romania

Niculescu Virginia, "Babes-Bolyai" University, Romania

Ogruțan Petre, University Transylvania Brașov, Romania

Păun Nicolae, "Babes-Bolyai" University, Romania

Petrescu Valentin, "Lucian Blaga" University, Romania

Petrescu-Mag Ioan Valentin, University of Agricultural Sciences and Veterinary Medicine,
Cluj-Napoca, Romania

Petrescu-Mag Ruxandra-Mălina, "Babes-Bolyai" University, Romania

Plângă Victor, Institute of Ecology of the Academy of Sciences of Moldova, Republic of
Moldova

Pop Ciprian-Marcel, Babes-Bolyai University, Romania

Popa Maria, "1 Decembrie 1918" University of Alba Iulia, Romania

Predescu Cristian, Politechnical University from Bucharest, Romania

Proorocu Marian, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania
Prunariu Dumitru-Dorin, Honorary Member of the Romanian Academy, Romania
Rademacher Yvonne, University of Delaware, Disaster Research Centre, U.S.A.
Robu Brîndușa, "Gheorghe Asachi" Technical University of Iasi, Romania
Roman Cecilia, INCDO-INOE 2000 Research Institute of Analytical Instrumentation, Cluj-Napoca, Romania
Roșu Cristina, "Babes-Bolyai" University, Romania
Rusu Tiberiu, Technical University of Cluj-Napoca, Romania
Silaghi Gheorghe Cosmin, "Babes-Bolyai" University, Romania
Sima Mihaela, Institute of Geography of the Romanian Academy, Romania
Sofronie Ramiro, University of Agronomic Science and Veterinary Medicine, Bucharest, Romania
Somlai Janos, University of Pannonia, Veszprém, Hungary
Soporan Vasile Filip, Technical University of Cluj-Napoca, Romania
Ștefănescu Lucrina, "Babes-Bolyai" University, Romania
Suciu Liviu, S.C. ICPE Bistrița S.A., Romania
Teodosiu Carmen, "Gheorghe Asachi" Technical University of Iasi, Romania
Török Zoltán, "Babes-Bolyai" University, Romania
Toth Ivan, University of Applied Sciences Velika Gorica, Croatia
Vișa Ion, Transilvania University of Brașov, Romania

Technical support

Andreica Mihaela, S.C. ICPE Bistrița S.A., Romania

Notes. Editors in chief and the managing editor are also reviewers. The responsibility of the papers' content gains exclusively to the authors.

CONTACT DATA

National Society of Environmental Science and Engineering

Address: Fântânele street, no. 30, 400294 Cluj-Napoca, Cluj county, Romania.

Web: <http://snsim.ro>

S.C. ICPE Bistrița S.A., Romania

Address: Parcului street, no. 7, 420035, Bistrița, Bistrița-Năsăud county, Romania

Web: www.icpe-bn.ro

Phone: 0263-210938

E-mail: ecoterraro@yahoo.com

University „Babeș-Bolyai” from Cluj-Napoca, Faculty of Environmental Sciences and Engineering

Address: Fântânele street, no. 30, 400294, Cluj-Napoca, Cluj county, Romania

Phone: 0264-307030

Web: <http://enviro.ubbcluj.ro>

Journal website:

www.ecoterra-online.ro

CONTENT

Kolomiets I., 2015 Evolutionary details of anthocyanin-coloring formation of corolla of flowering plants. *Ecoterra* 12(4):1-7.

Sandu V., 2015 Cycling and walking to school. A case study for Brasov, Romania. *Ecoterra* 12(4):8-12.

Vogth (Tecşa) V., Burghel B., Cucuş A., Iancu D., Cosma C., Moraru I. T., Giagias E., 2015 Preliminary results regarding the risk of lung cancer caused by radon exposure in Alba Iulia and surroundings. *Ecoterra* 12(4):13-18.

Zaharia S. M., 2015 Evaluation and impact of noise pollution caused by turbojet engines on people and the environment. *Ecoterra* 12(4):19-25.

Coste (Bână) A., Sur I. M., 2015 Influence of poultry manure and universal peat on the bioremediation of soil contaminated with diesel fuel. *Ecoterra* 12(4):26-31.

Ciorba D., Szacacs E., 2015 Environmental health impact assessment in soil samples from Copsa Mica area. *Ecoterra* 12(4):32-37.

Arghiuş V., Muntean L., Arghiuş C., Roşian G., Mihăiescu R., Baciú N., Maloş C., Măcicăşan V., 2015 Annual and seasonal air temperature and precipitation trends in the North of the Apuseni Mountains. *Ecoterra* 12(4):38-44.

Banu D., Mihai S., 2015 Integration of stochastic methods in the assessment of the risk generating phenomena. Study case - Tărnicioara tailings pond, Romania. *Ecoterra* 12(4):45-58.

Hroştea L., 2015 Characterization of silicon solar cells by numerical simulations using AFORS – HET program. *Ecoterra* 12(4):59-66.

Almasan E. M., Micle V., Boros M., Joger N., 2015 Methods using plants to clean the soils that are polluted with heavy metals. *Ecoterra* 12(4):67-74.

Radovici A., Munteanu L., Ozunu A., 2015 Development of an integrated methodology for the identification and classification of critical infrastructures at local level and associated risk assessment. *Ecoterra* 12(4):75-81.

Bican-Brişan N., Muntean L., Reti K., Roşian G., Măcicăşan V., 2015 The potential of field practical training in developing professional skills for the students of the Faculty of Environmental Science and Engineering, Babes-Bolyai University, Cluj-Napoca. *Ecoterra* 12(4):82-89.

Lupulescu A., Malschi D., Cosma C., 2015 Radionuclides (^{137}Cs) phytoextraction possibilities within the soil using grass crops (*Lolium perenne* L., *Hordeum distichum* L.). *Ecoterra* 12(4):90-94.

Brăhăita I. D., Baciú C., Lazăr A. L., Pop I. C., Truţă R. M., 2015 Passive systems for neutralizing the acid waters by using limestone. *Ecoterra* 12(4):95-106.

Constantinescu D., Cărlan B. A., Brînzan A., 2015 Remarkable events that have determined modifications in paleoclimate conditions. *Ecoterra* 12(4):107-117.

EDITORIAL FOREWARD

ECOTERRA Journal of Environmental Research and Protection was developed with the aim of responding to the growing needs of environmental specialists, now widely recognized in the scientific media. It is a quarterly journal, edited since 2004, with the clearly stated mission of fostering the communication and dissemination of interesting results among researchers and practitioners from a wide range of scientific areas, such as earth sciences, environmental protection, risk assessment, disaster management and so on.

ECOTERRA Journal of Environmental Research and Protection includes high-quality researches in the fields of engineering sciences, earth sciences, biotechnologies, environmental protection, notes on national and international scientific events, books or articles reviews and synthesis papers in the specific fields of the journal.

This issue of ECOTERRA journal is published under the aegis of The National Society of Environmental Science and Engineering (SNSIM), together with S.C. I.C.P.E. BISTRIȚA S.A. (Institute for Research and Development in Technologies and Equipments for Environmental Protection Bistrița), and the Faculty of Environmental Sciences and Engineering, University „Babeș-Bolyai” of Cluj-Napoca. SNSIM is a professional association of experts from academic and research institutes having specific activities in the field of environmental science and engineering. Its mission is to develop and promote the professional interests of their members, within a national and international context and to contribute to the development of the environmental science and engineering field in science and research.

Given the high interest of scientists and the variety of submissions, ECOTERRA has taken an initiative to become a peer-reviewed journal, having the articles published on its webpage. Thus, the research results will be accessible via the Internet for immediate worldwide, serving the best interests of the scientific community.

This new issue comprises diverse and original research from a broad spectrum of areas as varied as best available technology, natural gas extraction, atmospheric risks, waste management, energy efficiency, water purification, integrated environmental marketing, risk communication and equipments for environmental protection.

We are very thankful to the scientists and institutions that have contributed to the past history and, we hope, to the future development of this journal. This issue would not have been possible without the support of the editorial board members and the authors. We continue to welcome article submission in all fields of environmental science and engineering that will further stimulate research in these areas.

Editors-in-Chief
Professor Ozunu Alexandru, PhD, “Babeș-Bolyai” University, Cluj-Napoca
Vlad Grigore, PhD, S.C. ICPE Bistrita S.A.



UNIUNEA EUROPEANĂ



GUVERNUL ROMÂNIEI



UNIVERSITATEA BABEŞ-BOLYAI
CLUJ-NAPOCA



Instrumente Structurale
2007-2013

Programul Operațional Sectorial „Creșterea Competitivității Economice”
„ Investiții pentru viitorul dumneavoastră”

„Development of research infrastructure for disaster management based on high performance computing”

„Dezvoltarea infrastructurii de cercetare pentru managementul dezastrelor bazat pe calcul de înaltă performanță” – MADECIP

Project POSCEE COD SMIS CSNR 48801/1862

Babeş-Bolyai University of Cluj-Napoca develops, starting with March 2014, the project ***„Development of research infrastructure for disaster management based on high performance computing”***, co-financed by the European Regional Development Fund.

The total value of the project is 12,129,000.00 lei, out of which 10,000,000.00 lei is non-refundable financial assistance.

The project is developed in Cluj-Napoca, for a period of 16 months.

The objective of the project is to increase the research-development capacity of Babeş-Bolyai University of Cluj-Napoca, through the development of disaster management based on high performance computing. Furthermore, new laboratories/research centers will be founded and the existing ones will be updated, with the aim of creating new work places, intensifying interdisciplinary research and optimising international cooperation.

The MADECIP project is a complex, multidisciplinary project, developed by a consortium of 8 faculties in Babeş-Bolyai University: Faculty of Environmental Science and Engineering, Faculty of Economics and Business Administration, Faculty of Mathematics and Informatics, Faculty of Political, Administrative and Communication Sciences, Faculty of Geography, Faculty of Chemistry and Chemical Engineering, Faculty of Biology and Geology.

Further information:

Contact person: Prof. Dr. Alexandru OZUNU, Eng., project manager

Tel. 0264-307030, Fax: 0264-307032, e-mail: alexandru.ozunu@ubbcluj.ro